

A new species of *Argulus* Muller (Crustacea: Branchiura), with a note on the distribution of different species of *Argulus* in India

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Abstract. This paper describes a new species of *Argulus*, *Argulus mangalorensis* collected from the estuarine stretch of Nethravathy river of Mangalore, S. India. The distribution of different species of *Argulus* reported from India is also indicated.

Keywords. *Argulus mangalorensis*, n.sp. description, distribution.

1. Introduction

Two specimens of *Argulus* obtained from the plankton samples from Nethravathy estuary of Mangalore, are found to belong to a new species which is described here. Generally argulids are known to parasitize marine and freshwater fish. The present report records the occurrence of *Argulus* in the estuarine habitats as well. Both the specimens were gravid females and appear to have left their hosts for egg laying. The species of *Argulus* known so far from India are *A. indicus* Weber, *A. giganteus* Ramakrishna, *A. bengalensis* Ramakrishna, *A. siamensis* Wilson, *A. siamensis peninsularis* Ramakrishna, *A. puthenveliensis* Ramakrishna, *A. siamensis* sub sp. Sundari Bai, *A. fluviatilis* Thomas and Devaraj, *A. cauveriensis* Thomas and Devaraj, *A. japonicus* Thiele and *A. quadristriatus* Devaraj and Ameer Hamsa.

2. Descriptions

Argulus mangalorensis sp. nov. (figures 1-11)

Material: Two gravid females were obtained from the plankton samples from Nethravathy estuary on 3 April 1979. The holotype, a female measuring 8 mm long, will be deposited in the Indian Museum, Calcutta.

Adult female: Body (figures 1, 2) 8 mm long, carapace longer than wide 7.5×5.6 mm, anterolateral sinuses distinct, cephalic area 2 mm wide, convex above and spined ventrally, lateral lobes of carapace 5 mm long, rounded behind, spined on anteroventral surface, dorso-median sinus moderately deep, reaching to the level of anterior end of fourth thoracic segment.

The dorsomedial pair of longitudinal ribs of carapace convergent in the middle, curve outward beyond paired eyes anteriorly and below sucker posteriorly, posterior

pieces parallel, end near transverse groove of cephalic region. Each dorsomedial rib bears a pair of sutures at about its middle region, a pair of longitudinal sutures arise from below compound eyes, run sideways and proceed backwards and join the transverse groove of cephalic region. Secondary sutures arise from the triangular sutures, extend backward, parallel to the lateral lobes of carapace and reach almost at the level of base of fourth thoracic segment, and are connected with each other by a transverse groove. None of the sutures are marked by any pigments or coloured stripes.

Abdomen is 2.6×3.0 mm, truncate anteriorly, posterior lobes subacute, sinus deep, narrow anteriorly, and broad posteriorly. Caudal rami small, each with three terminal subequal setae.

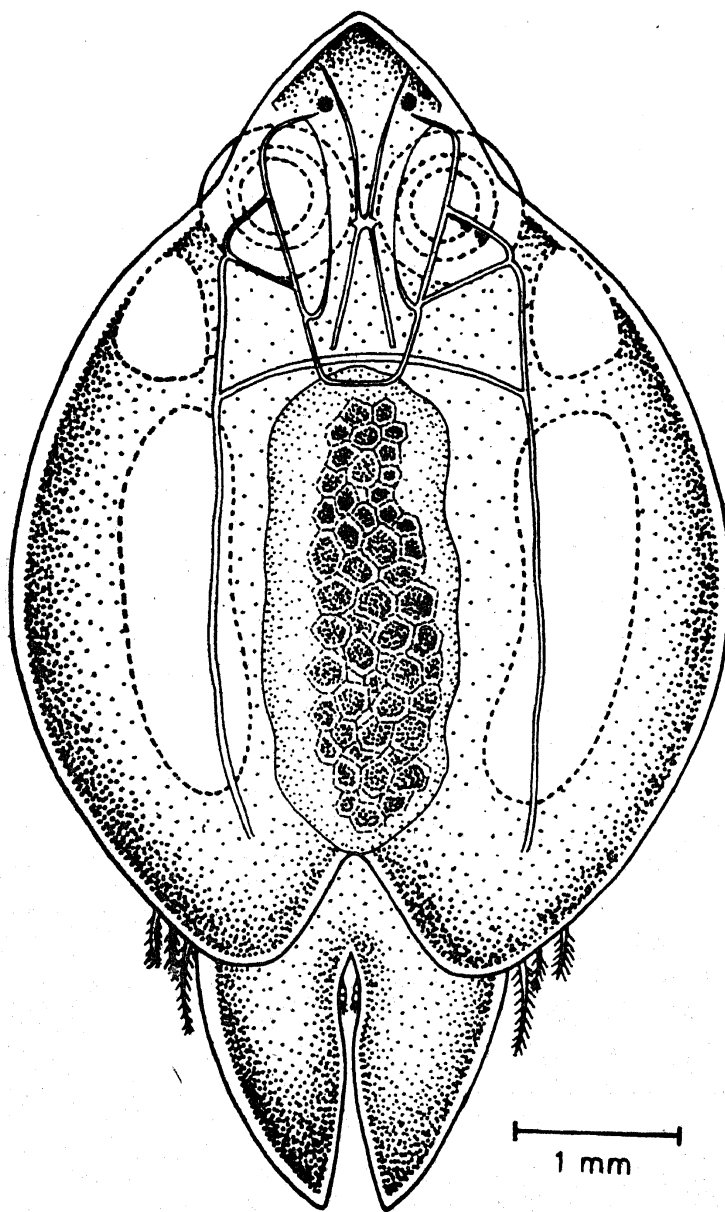


Figure 1

The anterior respiratory areas oval, equal in size, found near lateral margins of carapace between the level of base of suckers and maxillipeds. Posterior respiratory areas elongated, kidney-shaped, found between the level of origin of first thoracic segment and base of fourth thoracic segment.

Basal segment of first antenna with a strong medial outcurved spine, next segment with a stout spine and antennular spine strongly curved. Slender terminal segment of antenna with three minute spines and setae distally (figures 3, 4). Second antenna (figure 5) four segmented, basal segment broad with a stout spine at base, six setae on dorsal and four on ventral margins. Second segment elongated with four setae of which two are on dorsal margin, remaining two at distal seta. Fourth segment small, club-shaped with three small equal apical

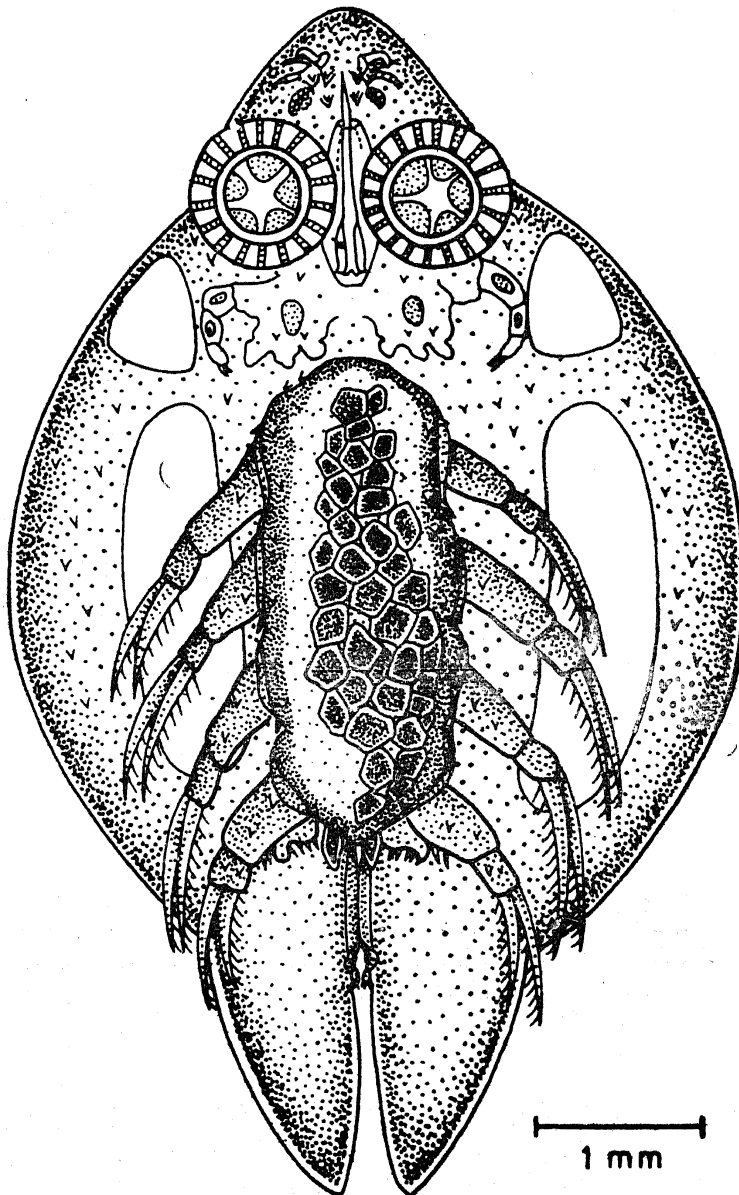
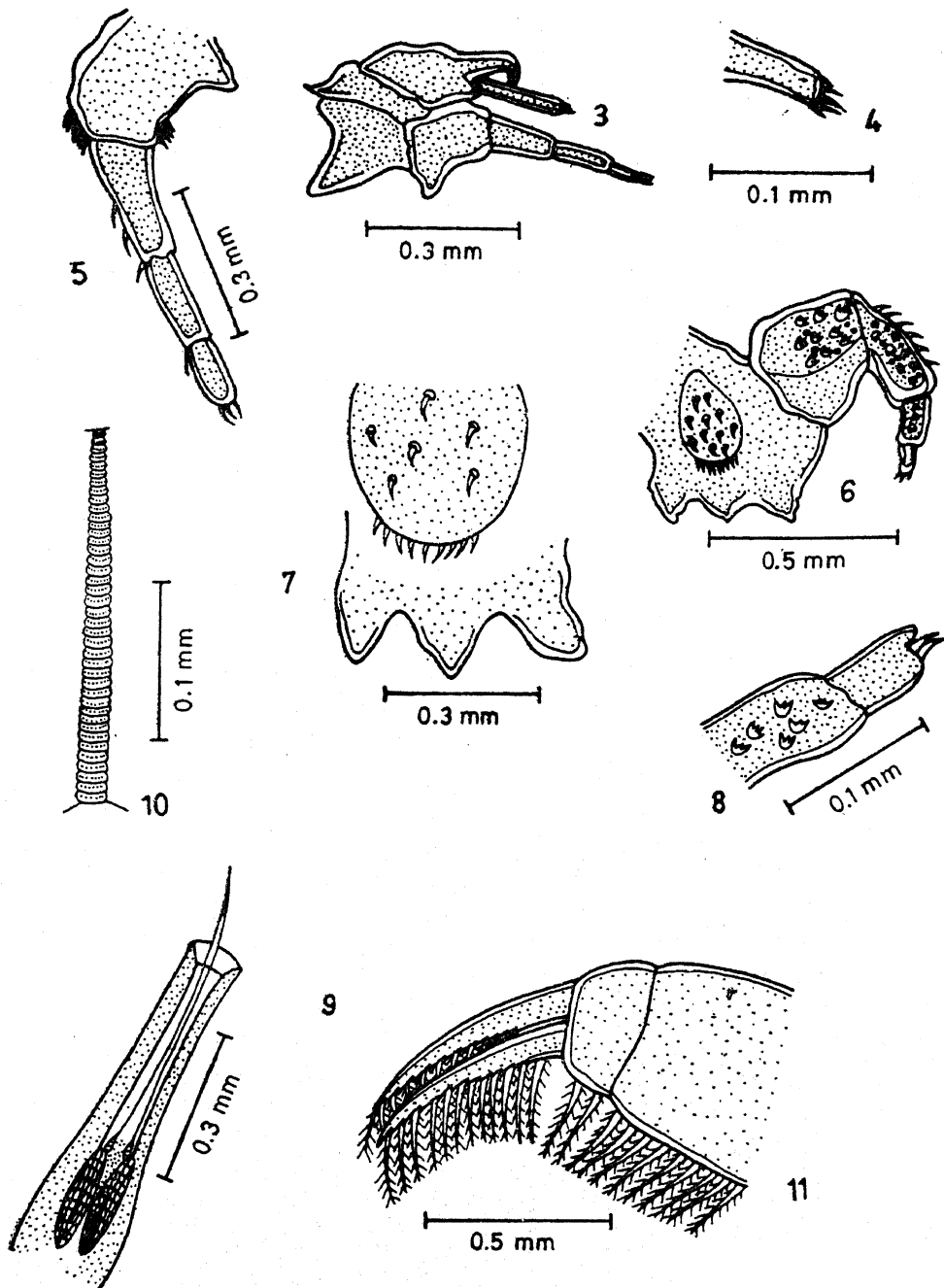


Figure 2



Figures 3-11

Figures 1-11. *Argulus mangalorensis* sp. nov. 1. dorsal view ; 2. ventral view ; 3. first and second antenna ; 4. distal end of first antenna enlarged ; 5. second antenna enlarged ; 6. maxilliped ; 7. basal segment of maxilliped enlarged ; 8. distal segment of maxilliped enlarged ; 9. stylet ; 10. single rib with plates ; 11. fourth leg.

spines. Postantennal spine very stout, maxilliped (Fig 6) five segmented, basal segment with three nearly equal stout posteromedial spines and a large oval spinous pad which carries nine setae along its setae. Second and third segments are provided with rectangular pads which carry scale-like spines and a row of

Table 1. Distribution of species and sub-species of *Argulus* from India.

Parasite	Host	Locality	Author and Year
<i>A. siamensis</i>	Not known	Harischandrapur, W. Bengal	Ramakrishna 1951
	<i>Ophiocephalus punctatus</i>	Champahati, W. Bengal	
	<i>Labeo rohita</i>	Siripur, Bihar	
	Not known	Mahananda River, Base of Himalayas	
<i>A. indicus</i>	Murrel	Saurashtra	Ramakrishna 1951
	<i>Ophiocephalus punctatus</i>	Champahati, W. Bengal	
<i>A. giganteus</i>	Not known	Not known	Ramakrishna 1951
	<i>Tetradon oblongus</i>	Bombay	Rangnekar 1957
<i>A. bengalensis</i>	Not known	Harischandrapur, W. Bengal	Ramakrishna 1951
<i>A. siamensis</i> sub sp.	Not known	Rajahmundry	Ramakrishna 1951
<i>peninsularis</i>	Ambassis ranga	Rajahmundry	Malaviya 1955
<i>A. puthenveli</i>	Not known	Not known	Ramakrishna 1962
	<i>Esomus danrica</i>	Kerala	Thomas 1961
	<i>Puntius vittatus</i>		
	<i>Macropodus eupanus</i>		
	<i>Panchax panchax blochii</i>		
<i>A. siamensis</i> sub sp.	<i>Lebistes reticulatus</i>	Hasaragatta, Bangalore	Sundari Bai 1973
<i>A. fluviatilis</i>	Not known	Hoginekal, Tamil Nadu	Thomas and Devaraj 1975
<i>A. cauveriensis</i>	Not known	Hoginekal, Tamil Nadu	Thomas and Devaraj 1975
<i>A. japonicus</i>	<i>Labeo fimbriatus</i>	Sathanur fish farm, Tamil Nadu	Prabhavathy and Sreenivasan 1976
	<i>Catla catla</i>		
	<i>Cyprinus. carpio</i>		
<i>A. quadristriatus</i>	<i>Psammoperca waigiensis</i>	Palk Bay, Mandapam	Devaraj and Ameer Hamsa 1977

similar spines on the margin of the third segment. Fourth segment which is smaller than the third, also carries spines. Fifth segment small with a blunt lobular distal end and two dissimilar claws on inner margin.

Paired lateral eyes conspicuous, located at base of antennal spine, median eye well developed, proboscis midventral, in between suckers. Distal half of proboscis expanded, anterior part narrow, terminating in a stylet (figure 9). Sucker 0.6 mm (inside diameter), composed of 115-118 ribs of 38 to 40 imbricated plates each (figure 10).

Distal ends of rami of third and fourth legs reach a little beyond carapace. Flagella of swimming legs absent, basal lobe of fourth leg boot-shaped, carries setae on ventral margin, basal segment of basipod with nine and distal segment with two plumose setae (figure 11). The thoracic segments and basipods with spines ventrally. Uterine eggs are four to five sided, arranged, in honey-comb pattern.

Colour : Body greenish yellow, papillae algal green, thoracic segments and legs straw yellowish and uterine eggs dull brown.

3. Discussion

In the arrangement of respiratory areas, *A. mangalorensis* agrees with 22 species of *Argulus* in Wilson's (1944) report. *A. kusafugu* and *A. scutiformis* from Japanese fishes (Yamaguti and Yamasu 1959), *A. indicus* and *A. giganteus* from India (Ramakrishna 1951), *A. japonicus* from pond fishes of Tamil Nadu (Prabhavathy and Sreenivasan 1976) and *A. quadristriatus* from a marine fish (Devaraj and Ameer Hamsa 1977). In the arrangement of the respiratory areas as well as the suction cup being composed exclusively of imbricated plates, *A. mangalorensis* is similar to *A. melanosticus*, *A. pugettensis*, *A. niger*, *A. floridensis* and *A. giganteus* and *A. quadristriatus*. However, the present species is distinct from the others by the following characteristics—(1) 115–118 number of ribs in each suction cup ; (2) 38–40 imbricated plates in each rib ; (3) three spines and three setae at the distal end of first antenna ; (4) absence of flagella on any of the swimming legs.

The distribution of *Argulus* spp. in India is given in table 1.

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